mittees, which have been appointed, in almost all the sections, to superintend Australian investigations. It is particularly gratifying to Australians that the Mawson Expedition has received special recognition, and that a grant has been given in aid of the production of the charts of Antarctic sea-depths, founded upon the observations of its members.

The good work done by members of the Association has not been confined to the official meetings. On the evening of their arrival, the astronomers met the local branch of the Astronomical Association; and the Astronomer-Royal and Prof. Turner gave up Sunday to visit in his home, some forty miles from Sydney, Mr. Tebbutt, the well-known Australian astronomer, whose advanced years prevented his attendance at Sydney. On Friday evening, Prof. Gonner and other economists and sociologists met with the local students of these subjects. On Saturday evening, Prof. Perry and Prof. Turner attended a special meeting of the local branch of the Mathematical Association, and by their addresses did a notable service to the teachers of mathematics in the secondary schools. On Sunday, one of the largest halls in the city was packed with an audience eager to hear Sir Oliver Lodge. Finally, the President of the Association filled up the vacancy created by the abandonment of the conversazione, by delivering an address in the Lecture Room of the Geological Department, when he showed a number of slides illustrating the first half of his presidential address, given in Melbourne. Thus, from the beginning of the meeting until its close the personality of its President was felt and realised.

H. S. CARSLAW.

NOTES.

SIR J. J. THOMSON, O.M., F.R.S., will deliver his presidential address to the Physical Society of London at the first meeting of the society, on Friday, October 23. The subject of the address will be "Ionisation," and the meeting will be held at the Imperial College of Science, South Kensington.

THE opening meeting of the new session of the Institution of Electrical Engineers will be held on Thursday, October 29, when the president, Sir John Snell, will deliver his inaugural address. At this meeting a marble bust of Michael Faraday will be presented to the institution by Mr. Llewellyn Preece, on behalf of the family of the late Sir William Preece, past president.

IN connection with the London County Council's work of indicating the houses in London which have been the residences of distinguished individuals, tablets have recently been erected commemorating the residence of Benjamin Franklin, at 36 Craven Street, and of the brothers Adam, at 4 Adelphi Terrace.

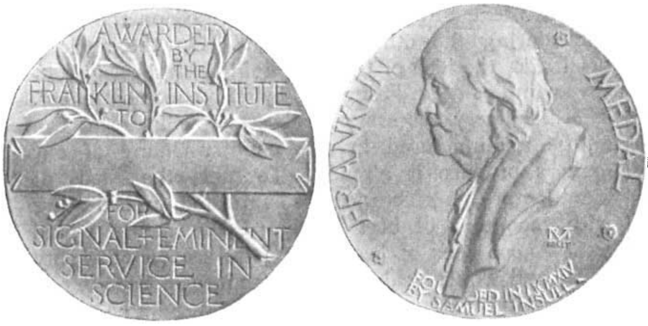
Engineering for October 9 has an article commenting on a paper by Mr. C. C. Humphris, of the Barrow Association of Engineers, and dealing with the development of the military small arm. Many charges of the use of unfair bullets have been made on both sides during the present campaign. The old Snider weapon made very bad wounds, but the penetrative power of the bullet sems to have been very small. With the Martini and the original Lee-Enfield bullet very clean wounds resulted. Mr. Humphris states that this is not the case with the new pointed bullet introduced by the Germans, which, unless it hits absolutely perpendicularly to the surface struck, is liable to turn round and proceed flat-long. He showed at the meeting of the association a block of oak fired at by Mark VI. and by Mark VII. ammunition, the latter having the new pointed bullet. The former made a clean hole 30 in. deep, while the latter turned round after entering the block, leaving a lacerated hole. According to Mr. Roosevelt, the tendency for the sharp-pointed bullet to turn in this way is only notable at short ranges.

THE *Engineer* for October 9 has a leading article on engineers and the sugar supply. It is estimated that to produce 1,500,000 tons of sugar would require some nine million tons of beet to be grown in this country. This would require, roughly, one million acres of land to be devoted to beet at one time. Beet should not be planted more often than once in three years—wheat and oats can be cultivated on the same land during the other two years. On the agricultural side, the idea of Great Britain being largely self-supporting as regards sugar is by no means chimerical. The machinery necessary for beet sugar factories can all be manufactured in this country—many of our makers produce it already. To meet the needs of manufacture, 110 factories are suggested, each dealing with 1000 tons of beet a day. Each factory would treat 80,000 tons of beet during its season of eighty days, and would deal with the produce of 8000 acres. The capital outlay on each factory would be about 120,000*l.*, and a profit of one-tenth penny per pound of sugar would give a return of about 10 per cent.—notwithstanding the fact that the factory would lie idle during the greater part of the year. The proposal seems to offer large commercial possibilities.

THE interest shown by the Americans in the exploitation of the resources of Peru is shown by the report of Mr. Osgood Hardy, reprinted from the Bulletin of the American Geographical Society, on the industrial prospects of South Central Peru, including the departments of Cuzco and Apurimac. The mineral resources of the district have been only imperfectly explored, and though some mines of silver and copper have been experimentally worked, the result has hitherto been inconsiderable. Above 12,000 ft. the potato is cultivated in a rude fashion, while at lower levels wheat, barley, and maize are grown. The district has recently been opened up by the railway to Cuzco, but the conditions of climate and labour supply are not promising, and the level of agriculture is so low that much demand for modern machinery is not to be anticipated. But so far as the resources of the native population go, some trade in cotton goods, tinned foods, cheap hardware, paints and oils, patent medicines, and toilet articles is being gradually developed.

Dr. Hiram Bingham, director of the Yale Peruvian Expedition, has issued two pamphlets reprinted from the bulletin of the American Geographical Society (vol. xlvi) and *Harper's Magazine* (August, 1914), describing his discovery of a mass of Inca ruins at Espiritu Pampa, Pampaconas Valley, lat. 12° 55′ long. 73° 24′. The district in which this city stood is at present occupied by a very primitive race, the Campa Indians, of whom some account with photographs is given. No other Inca ruins have hitherto been found so low down on the jungles of the Amazon valley. In the Relacion of Diego Rodriguez de Figueroa he describes meeting the Inca Titu Cusi Yupanqui in this neighbourhood, where possibly this was one of his royal cities. While the pottery and architecture are unquestionably of the Inca period it is curious to note that some Spanish roofing tiles were found. It is supposed that these may have been made experimentally by recent Peruvian occupants of the site, or possibly by some early Spanish missionaries who may have come here some three centuries ago.

The Secretary of the Franklin Institute of the State of Pennsylvania for the Promotion of the Mechanic Arts, in a letter from Philadelphia, informs us that a member of the institute, Mr. Samuel Insull, president of the Chicago Commonwealth Edison Company, has founded a medal for the institute, to be known as the Franklin medal. The medal is to be awarded from time to time to workers in physical science or technology, without regard to country, whose efforts, in the opinion of the board of management of the Franklin Institute, have done most to advance our knowledge of physical science or its application. Mr. Insull provided the sum of 1200*l.* for the execution of the scheme, and about 200*l.* has been applied for the purpose of paying for the design of the medal and the necessary dies and diploma plates. The medal is of gold, and has an intrinsic value of about 15*l.* Should the income derived from the fund be more than sufficient to provide such medals, the institute may award the surplus as premiums to accompany the medals. The medal has been designed by Dr. R. Tait McKenzie, of the University of Pennsylvania, and the accompanying illustration gives an idea of its general character.


AWARDED BY THE FRANKLIN INSTITUTE TO
FOR SIGNAL + EMINENT SERVICE IN SCIENCE
FRANKLIN MEDAL
FOUNDED IN MCMXIV BY SAMUEL INSULL

Reverse. Obverse.

The Franklin Medal. Two-thirds natural size.

The *Museum Journal* (vol. v., No. 2) describes an interesting collection of objects of Buddhist and Indian art, formed at Darjeeling, during a long residence, by Mr. A. Scott, which has been recently acquired by the Philadelphia Museum. Mr. Scott established close relations with the Tibetan Lamas, and the symbolism of the objects collected by him have been interpreted by Lama Dousand Up, of Darjeeling. Many of them are of Indian origin and display considerable artistic skill. The most valuable specimen is an ivory tablet representing the chief episodes in the life of Buddha. This is believed to be Assamese work of the fifth or sixth centuries A.D., and represents an early type of Buddhist iconography. Even more remarkable is, so far as can at present be ascertained, the only crystal statuette of Buddha known to collectors, that at Kandy, in Ceylon, being of Chinese manufacture, and comparatively modern. The collection also includes fine images of Dolma or Tara, the tutelary Tibetan goddess, of the eleven-headed Avalokitesvara, and of the Diamond Sow goddess, with some lamps and other examples of modern Nipalese art. The collection, while far from rivalling those of the British and India Museums, is of some importance, and its acquisition illustrates the interest in Indian art now shown in America.

The chief items in the October number of *British Birds* are a report, by Mr. M. Vaughan, on last year's inquiry into the relative numbers of summer migrants to this country, and notes, by the editor, on the recapture of marked birds.

The effects of the war are being so severely felt by the Selborne Society that in the October number of the *Selborne Magazine* an appeal is issued by the council urging all members to endeavour to increase the membership roll and to promote the interest of the society by such other means as lie in their power.

We have to acknowledge the receipt of an article by Mr. R. R. Parker, from vol. xxv. of the Proc. Boston Nat. Hist. Soc., on the New England flies of the family Sarcophagidæ, and of a second, by Mr. T. Southwell, from vol. x. of the Journ. and Proc. Asiat. Soc. Bengal, on the tape-worms of India and Ceylon.

It appears from the autumn number of *Bird Notes and News* that the nesting-boxes supplied to its constituents by the Royal Society for the Protection of Birds have hitherto been made in Germany; the industry is now, perforce, to be transferred to this country. The bird-sanctuary at Brean Down is reported to have been very successful during the past breeding-season; and it is also mentioned that perches and rests for birds have been fitted by Trinity House workmen, under the auspices of the society, to the South Bishop Lighthouse, Pembrokeshire.

Part ii. of vol. x. of Annals of the South African Museum is almost exclusively interesting to specialists, the contents including two papers by Mr. K. H. Barnard on the crustacean fauna of South Africa, with descriptions of many new species, and one by Miss G. Ricardo on the South African gadflies of the family Tabanidæ, also with diagnoses of new forms. Of somewhat wider interest is an account, by Mr. A. Raffray, of a strange-looking beetle taken in a termite-nest at Kimberley, and regarded as representing a new genus and species—*Gasterotropis poweri*—although closely related to the Indian Aphanetrix.

As announced in the *Morning Post* of October 8, the Natural History Museum has received the carcase of a female Sowerby's beaked whaled (*Mesoplodon bidens*), recently stranded at Rosslare, Ireland. Described by Sowerby in 1804, on the evidence of an individual washed ashore in Elgin four years previously, this cetacean is rarely met with, either in British or foreign waters, the present example being, it is stated, only the twelfth recorded from the coasts of the British Islands. It has been carefully dissected by Mr. W. P. Pycraft, who, we understand, has made some interesting observations with regard to the arrangement and relative proportions of certain of the visceral organs.

IN the fourth part of vol. iv. of the Annals of the Transvaal Museum, Dr. E. C. N. van Hoepen continues his articles on the fossil reptiles of the Karroo beds, dealing in this instance with the lower jaw of the dicynodont Lystrosaurus (Ptychognathus). After describing the various elements which go to form this compound bone, the author refers to a paper by Mr. D. M. S. Watson, in the *Ann. Mag. Nat. Hist.* for December, 1912, in which he noticed that some of the features there described as distinctive of the lower jaw of Dicynodon do not accord with his own interpretation of the structure of that of Lystrosaurus. A re-examination of the lower jaws of both genera served to confirm Dr. van Hoepen's original diagnosis.

ACCORDING to a communication from Messrs. G. H. Carpenter and T. R. Hewitt, in the October number of the *Irish Naturalist*, the vexed question as to the mode in which the maggots of warble-flies first effect entrance into the bodies of cattle has been finally settled. Hatched in many instances on the feet of their hosts, the minute maggots normally bore through the skin to the subjacent tissues, whence they eventually make their way to the back, where they encyst themselves in the well-known "warbles." Whether the second-stage maggots frequently observed in the gullets of cattle are merely enjoying a halt on their long subcutaneous journey from the limbs to the back, or whether they enter the mouth from outside, requires further investigation.

REPRODUCTIONS of five beautiful autochrome photographs of the marvellous scenery—both as regards form and colour—of the Grand Canyon, Colorado, constitute an attractive and striking feature of the second (July) number of the Brooklyn Museum Quarterly. The letterpress includes a picturesque narrative, by Mr. R. C. Murphy, of a collecting cruise from Fernando Noronha to South Georgia, undertaken in 1912 on behalf of the museum. Lying as it does only 3½° south of the equator, and being cooled by a constant trade-wind, Fernando Noronha might be made one of the most productive islands in the world, instead of remaining the desolate convict-station of Brazil. In the Antarctic the party was chiefly occupied in observing whales, sea-elephants, and penguins and other birds, as well as in collecting such of the latter as were required for the museum. "On the South Georgia banks," writes the author, "the abundance of whales is nothing short of astounding, but as during our visit I sometimes saw eleven steamers hunting almost within hail of each other, and as twice that number often came into the ports with from two to ten whales apiece, the various species can scarcely hold their own many seasons longer."

THE annual report of the Marine Biological Association of the West of Scotland for 1913 indicates that a considerable amount of advanced research work was done at the Millport Station during the year. Summaries of the results are given in the report of the superintendent, Mr. R. Elmhirst, and in abstracts of papers read at meetings of the association held in Glasgow. The most striking portion of the report is a lecture by Prof. E. W. MacBride, on some problems of marine biology, which gives a useful summary of the lecturer's recent researches on hybridisation of echinoderms.

THE report of the Cullercoats Marine Laboratory for the year ending June, 1914, is characterised rather by the number of subjects studied and the extent of the ground covered than by the importance of the new information furnished on any particular subject. Prof. Meek's papers on trawling experiments and on migrations of plaice and dab deal with small numbers and do not furnish anything strikingly new. The discussion on the probable origin of the migrations is interesting and suggestive, but from the nature of the case it is entirely speculative. Work on races of herrings, commenced in 1912, has been continued. The number of fish measured is larger than in previous years, and this research is probably the most important contribution to fishery science in the report. Other papers deal with crabs and lobsters, mussel and lobster culture, and the pollution of the river Tyne. There are also two faunistic papers on hydrozoa by J. H. Robson.

THE meteorological chart of the North Atlantic Ocean for October, published by the Meteorological Office, states that steamers crossing that ocean are not likely to experience much, if any, delay from fog. With the exception of a few small areas of mist, neither fog nor mist is probable south of the parallel of 40° N. and west of longitude 20° W. It is not unlikely, however, that thick weather may be experienced on parts of the coast of Africa; this is principally due to red dust blown seaward from the Sahara and to mist from marked changes of temperature of air and sea. December to April are said to be the months of maximum frequency of red dust.

WE have received from Mr. J. Baxendell, the energetic meteorologist to the Southport Corporation, the report of the results of observations for the year 1913 at the exceptionally well equipped station at that place. Returns are regularly supplied to the Meteorological Office, together with telegraphic notice of all gales. In the course of the year the hourly statistics of the duration of winds from different directions (partially published in 1912) have been materially extended. These, when discussed, as promised, will throw much light on the climate of Southport. With reference to the latter, Mr. Baxendell remarks that, owing to the sea breezes, all the summer months are cool by day; generally speaking, there is more sunshine in the afternoon than in the morning. July is the best month of the year for outdoor life; May and June, and even September, are more settled than August. The report includes, as usual, a very handy table of comparative climatological statistics at health resorts and large towns, compiled from Meteorological Office data.

In the Bulletin of the Calcutta Mathematical Society, vol. ii., part 1 (Calcutta University Press, 1914), a paper is published by Mr. Jibon M. Bose, on the equations of motion of a plane kite, with special reference to its equilibrium, small oscillations, and conditions of stability. The paper thus constitutes a solution of Problem 16 of Bryan's "Stability in Aviation" (p. 180). In the case in which the kite is a plane lamina without keels, the author, as might be expected, obtains cubic equations for the longitudinal and lateral stability. This result is in accordance with the corresponding results for an aeroplane in which certain roots of the biquadratics vanish unless the aeroplane is provided with auxiliary surfaces.

THE *Morning Post's* "own correspondent" in Rome announces that Prof. Argentieri, of Aquila (there is no university in Aquila, and we do not find Prof. Argentieri's name in "Minerva"), has invented a "pocket" system of radio-telegraphy, in which apparatus costing twelve shillings is capable of intercepting messages from the Eiffel Tower, a distance of 730 miles, that the German Government has offered him a large sum of money for the system, and that he has patriotically refused it, preferring to place his invention at the service of his own Government. It is true that the aerial for receiving messages of high power need not necessarily be of great length, that a great deal of wire can be coiled up in the pocket and erected on light portable posts to a considerable height, and it is also true that the remaining apparatus, for receiving only, may be of small bulk, but one can well be sceptical as to the authenticity of such a statement as the above. Perhaps the time will come when a man may slip a telephone receiver over his head, put up an aluminium-framed umbrella, stand with his feet in a puddle, and, using a battery, induction coil, and a sending key disposed in various pockets, and a detector in his hat, communicate freely with friends a few hundred miles away. But we have not reached this point yet, and, at present prices, the aluminium umbrella alone would probably cost twelve shillings. We are willing to give Mr. Argentieri the full credit his invention deserves so soon as he has found an opportunity to explain its details or to demonstrate its capabilities, but, in the meantime, we cannot take seriously the description given in our contemporary.

THE following forthcoming books are additional to those announced in our issue of last week:—In *Anthropology and Archaeology*: The Literature of the Ancient Egyptians, Dr. E. A. Wallis Budge; A History of the Egyptian People, Dr. E. A. Wallis Budge (J. M. Dent and Sons, Ltd.); Ægean Archæology, H. R. Hall (The Medici Society, Ltd.); A Hausa Phrase Book, with Medical and Scientific Vocabularies, A. C. Parsons; Contributions to the Ethnology of the Salish Tribes, J. A. Teit; Coos Texts, L. J. Frachtenberg (Oxford University Press). In *Geography and Travel*: Life and Death in the Antarctic, Sir D. Mawson, two vols., illustrated (W. Heinemann); Indo-China and its Primitive People, Capt. H. Baudesson, illustrated; The Roman Colonies of North Africa, and their Ruined Cities, R. Sturzenbecker, illustrated (Hutchinson and Co.); Geography of Eastern Asia, D. Paton (Oxford University Press); On the Trail of the Opium Poppy, Sir A. Hosie, two vols., illustrated (G. Philip and Son, Ltd.); Travels in the Middle East, Lieut. T. C. Fowle, illustrated; The Voyages of Capt. Scott, retold by C. Turley, illustrated (Smith, Elder and Co.). In *Mathematics and Physical Science*: Electric Waves, Prof. G. W. Pierce; The Emission of Electricity from Hot Bodies, Prof. O. W. Richardson; Colloidal Solutions, Prof. E. F. Burton; Atmospheric Ionization, Prof. J. C. McLennan (each in the series of Monographs on Physics), (Longmans and Co.); Elementary Principles in Statistical Mechanics, Prof. J. Willard Gibbs (Oxford University Press). In *Medical Science*: The Evolution of Modern Medicine, Sir W. Osler (Oxford University Press). In *Metallurgy*: Zinc, Dr. J. S. G. Primrose; Aluminium, Dr. R. Seligmann; Metallurgy of Strain, S. C. W. Humfrey; Brass, G. D. Bengough; Refractory Metals, W. C. Hancock (Constable and Co., Ltd.). In *Technology*: Electrical Installation Manuals on Conductors, House Wiring, etc.; Lamps, Switches, Fittings, Transformers; Bells, Telephones, etc.; Testing and Localizing Faults (Constable and Co., Ltd.); Architectural Acoustics, W. C. Sabine (Oxford University Press).

A NEW and cheaper edition of the late Dr. Alfred Russel Wallace's book, "The World of Life: a Manifestation of Creative Power, Directive Mind, and Ultimate Purpose," has been published by Messrs. Chapman and Hall, Ltd. In its original form the work was reviewed at length in our issue for June 8, 1911 (vol. lxxxvi., p. 481), and it will be sufficient here to say that it can now be obtained at the price of 6*s*. net.

OUR ASTRONOMICAL COLUMN.

COMET 1913*f* (DELAVAN).—M. P. Puiseux communicates to the *Comptes rendus* for September 28 (vol. clix., No. 13) an account of photographs of Delavan's comet (1913*f*) which have been obtained at the Paris Observatory with the Henry-Gautier equatorial on September 5 and 6. The plates are impressed with a réseau, and each shows at least six stars which figure in the catalogues of the Astronomische Gesellschaft, executed at Bonn and Cambridge, together with a large number of fainter stars. Thus the necessary data are available for the determination of two accurate positions of this object. The comet on these dates was a little fainter than a 3·3 magnitude star. M. Coggia, in the same number of the *Comptes rendus*, gives five observations of positions of this comet made between September 14 and 18. On these dates the comet presented a round nucleus of about magnitude 5 with a tail of about 1° in length.